EARTH SATELLITE CORPORATION
(EarthSat)

1771 N STREET, N.W., WASHINGTON, D.C. 20036 / (202) 785-1123

September 1, 1972

ERTS Program Manager
Code ER
NASA Headquarters
Washington, D.C. 20546

Dear Sirs:

Earth Satellite Corporation (EarthSat) is pleased to submit a progress report for the period of July 1, 1972 to September 1, 1972. To facilitate for review by NASA, a consistent summary format has been adopted:

A. TITLE: Study of Application of ERTS-A Imagery to Fracture-Related Mine Safety Hazards in the Coal Mining Industry (P-187)

B. PRINCIPAL INVESTIGATOR: Dr. Charles Wier (SR #325)

C. PRINCIPAL CONTRIBUTORS: Dr. Charles Wier
Dr. Frank J. Wobber
Mr. Orville R. Russell
Mr. Roger Amato

D. SUMMARY OF ACCOMPLISHMENTS:

The following is an overview of accomplishments to date. The pre-launch phase (as redefined) if nearly complete.

1. A literature search has been completed and pertinent articles relating to fracture analysis (with emphasis given to those concerning glacial till-covered areas) have been identified.

2. An evaluation of mine accident reports has been made by the Indiana Geological Survey and the data is now being summarized on a series of maps at 1:250,000 scale. These data will be correlated with data derived from aerial and orbital imagery analysis.

3. Dr. Wier (Indiana Geological Survey), Dr. Wobber (EarthSat), and Mr. Russell (EarthSat) conducted field studies in the Sullivan and Pike County test areas. This trip, made in conjunction with an orientation briefing to the Indiana Geological Survey personnel on the utility of small scale imagery, provided an intimate look and assessment of the problems of acquiring fracture data in till-covered areas.

4. Color infrared photography at a scale of 1:120,000 was acquired over much of the project area in 1971, in conjunction with the Corn Blight Project. Mid-May and June coverage has been acquired and fracture analysis of the photography is being conducted at EarthSat's Washington, D.C. office.

E. SIGNIFICANT RESULTS:

1. Numerous fractures are identifiable on the 1:120,000 color infrared photography. Some of these fractures are in the proximity of operating open pit mines and should provide opportunities for field checking and confirmation.

2. The Manned Spacecraft Center has advised the Indiana Geological Survey and EarthSat that the test sites in southern Indiana have been overflown for radar and photographic data.

F. PROBLEMS:

As of this reporting date, no ERTS-1 imagery has been received.

G. RECOMMENDATIONS FOR TECHNICAL CHANGES:

Pre-launch activities associated with this experiment were started on July 1, 1972. Because starting date closely preceded the ERTS-1 launch, these activities have been telescoped substantially and in some cases modified. (The planned changes in the pre-launch phase have been submitted to the Technical and Scientific Monitors for approval).

H. CHANGES TO STANDING ORDER FORMS:

A Standing Order Form, reflecting the coding of Handbook revision (February 15, 1972), was submitted to the Technical Monitor on July 7, 1972.

I. OVERVIEW OF INVESTIGATION:

The Corn Blight Program photography is proving useful in providing an overview of the area at a scale intermediate between ERTS-1 and conventional scale photography. Valuable information concerning (fracture) lineaments in till-covered areas is being derived that is probably not as evident at larger scales. This encourages the investigators that ERTS-1 data will prove valuable.

Plans for the following reporting period are to complete the analysis of aerial color infrared photography at 1:120,000, draft the data and make a preliminary evaluation of the results. The analysis of the radar imagery acquired by MSC over the test areas will commence. The ERTS-1 imagery, when received, will be analyzed by various enhancement techniques.

Questions concerning this report should be directed to the undersigned at (202) 785-1123.

Sincerely yours,

Frank J. Wobber
Director
Geosciences and Environmental Applications